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SCIENCE

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FOR THE ADVANCEMENT OF SCIENCE

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ON SOME POINTS OF IMPORTANCE TO ANATOMISTS¹

It has been said that the president of a scientific association should not burden its meeting with an address in case the communications to be made to it are numerous and of value. If this be true it seems to me that we have reached a stage at which silence on my part would be appropriate, but I can not resist the temptation to exercise my right to speak, for a few minutes only, regarding some points which I consider to be of vital importance to our profession and to this association.

I think we have safely passed the pioneer stage in the development of scientific professions in America and it is unnecessary now to formulate the forces which have brought this change about, for they are known to us all. However, during the development of a science, it is well for the workers in it to meet from time to time to pass judgment upon the recent progress that has been made. Their approval, given on such an occasion to an investigator, is a most encouraging stimulus and election by his colleagues to the presidency of such a meeting is the highest honor a scientist can receive. I accept with gratitude this elevated post to which you have appointed me and regard it not as approbation of myself, but rather as a mark of appreciation of the co-workers, whom I have had the good fortune to have associated with

MSS, intended for publication and books, etc., intended for review should be sent to the Editor of SCIENCE, Garrison-on-Hudson, N. Y.

¹ Remarks by the president at the twenty-first meeting of the Association of American Anatomists, New York, December 27, 1906.

me in Baltimore, and of their contributions to anatomy.

More than a century ago the status of anatomy in America compared favorably with that in Europe, but the degeneration of medical education which followed rapidly and successfully pushed anatomy into an inferior position. This decay in medical instruction reached in America as low a level as the civilized world has perhaps ever seen about the time of our civil war. At this period the chair of anatomy was almost always used as a stepping-stone to that of surgery and under these conditions the quality of the teaching was rarely good. A certain type of surgical anatomy developed from this combination and but very few contributions to the science were made. Too often, however, there was a mere exploitation of the chair of anatomy, the teaching was poor, and the practical work in the dissecting room was neglected. Since then there has been a gradual improvement in medical education, due largely to the cultivation of its underlying sciences. During all those dark years, however, there was one place in which the light of anatomy shone continuously; thither Caspar Wistar carried it and there the Wistar Institute is located.

Caspar Wistar, the second professor of anatomy at the University of Pennsylvania, did much to perpetuate the good traditions of Benjamin Franklin, John Morgan and William Shippen. He was a man of great influence, took a lively interest in natural history, and made many anatomical specimens, some of which may still be seen in the Wistar Institute. He wrote an excellent text-book of anatomy, which was used by many students. He was succeeded first by Physick and then by Horner, who made a number of important discoveries in anatomy. Horner was followed by Dr. Leidy, who held the chair for nearly forty years. During all these

years the chair of anatomy became notably conspicuous on account of the luster shed upon it by the eminence of its occupants. The greatest of this brilliant group was Leidy, in fact he was the greatest teacher of anatomy to medical students this country has seen. His ideals were of the highest and his scientific discoveries were numerous and accurate, contributing much to comparative anatomy and zoology. The good influence he exerted upon the various institutions in Philadelphia has been extended over the nation through this association, of which he was one of the founders. It is also fitting, and by no means accidental, that the Wistar Institute is located in Philadelphia. Few, perhaps, are aware of what has really taken place at this great foundation for scientific anatomy. Thanks largely to the far-seeing policy of its present director, Dr. Greenman, the first division of its staff has been manned by the ablest investigators in neurology, and the Institute has been made the central institution for America by the Commission for Brain Investigation appointed by the International Association of Academies. I sincerely hope that our society will give full support to the Wistar Institute, for its work will be national as well as international.

On account of the low ebb of medical education at the period mentioned a certain dividing of the ways occurred, best illustrated, perhaps, by what happened at Harvard. At this college there fortunately appeared the ablest anatomist this country has yet produced, but the Medical School saw fit to duplicate his chair for reasons that are not clear to me. There existed in Harvard College and Harvard Medical School, side by side, Jeffrys Wyman, the scientific anatomist, with but few students, and Oliver Wendell Holmes, the poet anatomist, with many of them. This unwise arrangement, it seems to me, de-

played the revival of sound medical education in this country for a number of years. However, the presence of Jeffrys Wyman in the Hersey chair of anatomy was of the greatest significance in founding the American school of zoology. Wyman graduated from Harvard Medical School in 1837, and after having been Warren's demonstrator of anatomy, succeeded him in 1847. During the following quarter of a century he made numerous important discoveries in comparative anatomy and embryology and contributed also to teratology and ethnology. The loss of the influence of this great philosopher and teacher upon medical students has been one of the misfortunes that medicine in this country has sustained. But it was in zoology in America that scientific anatomy was temporarily preserved and extended rather than in the departments of anatomy in the medical schools. The American anatomists should emulate Jeffrys Wyman and our first president, Joseph Leidy.

Under the conditions which prevailed it was quite natural that the better work of Europe—the work of anatomists like Blumenbach, Ernst Heinrich Weber, Meckel, Johannes Müller, Schwann and Kölliker—barely reached this country, for the little anatomy that was cultivated subserved the surgical art. This arrangement may possibly have been beneficial as a training school for surgeons, but it was so bad for anatomy that as a science and as a profession it gradually fell into disrepute among most of the people. This conception of anatomy as a mere maid-servant of surgery is still entertained by some of our colleagues in other sciences. In nearly all of the medical schools anatomy settled down to a dead level, the so-called 'practical,' and, during the second half of the past century most of the progress made in Europe found its way to America not by way of American anatomists, but through

our zoologists, pathologists and physiologists. Fortunately, many of the latter have kept their membership in this society, for while this association consists of anatomists, a perusal of the list of members shows that some are also distinguished as physicians, surgeons, physiologists, pathologists, zoologists, anthropologists or psychologists. This I consider to be a fortunate circumstance, for it will prove to be a most potent factor in the reorganization and development of anatomy in this country and in its consequent broadening influence upon medical education. However, the catholicism in our society is not properly appreciated by educated people in America, for we often hear it said that our more prominent members are not anatomists, but biologists or something else. Let me illustrate: probably the most typical anatomist of us all, a man of the widest culture and a profound scholar, a scientist known as an anatomist the world over, a member of our executive committee for eight years, a founder of the *American Journal of Anatomy* and my predecessor in office, has been wrested from our ranks and called a zoologist by a recent writer in his study of American scientists. That a single writer should do this would be of no special importance, were it not that this view of the scope of anatomy is entertained by so many Americans of prominence that it interferes very much with the development of our science as a profession. Those who hold this narrow and perverted view of anatomy can not be familiar with its history, its present status in Europe, nor its recent development in America. It is the duty of the members of this association to correct this erroneous conception of anatomy by precept and by example. I have full confidence that this can be done with ease.

That anatomy played so important a rôle in the development of our school of zoology

(was absorbed in it, some will say) while it was fossilizing in medical schools can be viewed as a fortunate condition from a number of standpoints. For us it hastened the destruction of certain traditions, which can now be ignored while we are constructing a new anatomy and establishing a new *modus vivendi* with the medical disciplines. With this change we are placing ourselves in a new and a better position than ever before. While anatomy is well represented in college and university departments not connected with medical schools, we must look for the highest development to anatomy in connection with medical education. In order to be more effective in the training of scientific physicians, we are gradually making our anatomical instruction more and more inductive and this naturally reacts upon the instructor in a beneficial way.

To bring about the desired reform it is necessary to have represented in an anatomical department, even in a medical school, all which naturally belongs to this science. The study of anatomy begins with the cell, ends with the entire individual, and includes man. In fact the greatest anatomical problems almost always involve a consideration of human anatomy. The teachers and students in an anatomical department should be given a free hand; they should not be retarded by arbitrary lines; they should dissect sometimes with the scalpel, sometimes with the microtome knife; they may look through spectacles or through the microscope and they may study the arm of a human embryo or the negro brain. In other parts of the world this liberty is a self-evident necessity and has always been granted. It follows from what I have said that an anatomical department must include histology, histogenesis and embryology; in a medical school it must cover vertebrate anatomy in the fullest sense. In general, due to the influence of

this society, an unrestricted anatomical department has found its way into nearly a dozen important universities during recent years. Among the universities in large centers those in this city are the only ones in which the scope of the anatomical departments is still limited, since here histology and embryology are not included. Our wandering society, meeting as it does, in different portions of the country, will be, I believe, a great force in helping to perfect and to extend anatomical departments.

This is not the time to enumerate the really good anatomical departments, nor those that have been markedly improved in recent years, but I must not fail to note the great advancement which has been made in our state universities, due to the enlightened policy of their presidents, who are of the opinion that a professor of anatomy should be a specialist ranking high in his profession. It is safe to say that those departments in which the staff is actively engaged in scientific research are contributing most to medical progress and are exerting the best influence upon medical students. Yet, American anatomical departments taken as a whole are rendering an unsatisfactory account of themselves, and it is eminently desirable that this should change. In our wanderings as an association during the last dozen years we have had good opportunities to witness the improvements and growth which have taken place from year to year in the better universities. During this period we have met at Columbia three times, and it is a pleasure to me to acknowledge to Professor Huntington the obligations of this society for the splendid example he sets before us.

It is stated in our constitution that "the purpose of this association shall be the advancement of anatomical science." I firmly believe that such advancement can be made through scientific investigation only,

but we must provide a suitable atmosphere for our investigators. It seems to me that certain conditions, which are necessary to make a good atmosphere, are, as yet, lacking in many institutions. Probably the most serious defect in our anatomical departments is due to the appointment of men in active medical practise to the chairs of anatomy. Unlike professional anatomists, they rarely have the time to devote to teaching students, nor the requisite training to enable them to develop the department properly, and anatomy necessarily suffers. However, I regard it as fortunate that circumstances have placed us in a position from which there is no retreat. To carry on the campaign, now so well started, we must have many more productive anatomists. In order to obtain them and to make the efforts of our present investigators more effective, we must use all our influence to bring the greatest opportunities and the best men together. A highly cultured community naturally desires the ablest man. My earnest hope is that those in authority in various communities will recognize that our idea of the scope of anatomy is correct, and that they will seek productive anatomists, when vacancies occur, so that our grand science may be raised to the level it has always held in Europe.

FRANKLIN P. MALL

THE AMERICAN ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE
SOME PHASES OF PREHISTORIC
ARCHEOLOGY¹

THE American field for anthropological research is so wide and so fertile that it not only monopolizes the attention of specialists at home, but also attracts to our shores numerous foreign investigators. For attestation of this fact, one has but to cite

¹ Address of the vice-president and chairman of Section H—Anthropology—at the New York meeting of the American Association for the Advancement of Science.

the fourteenth International Congress of Americanists held in the city of Quebec last September. The same congress had convened in the new world twice before, once in New York City and once in the City of Mexico, the remaining sessions having been held in various European cities.

When foreign savants take such a deep interest in our own problems it is fitting that we should reciprocate by at least an occasional survey of the foreign field. In looking over the list of vice-presidential addresses read before this section, I find that two such surveys have already been made.² The address of Professor E. S. Morse, entitled 'Man in the Tertiaries,' was a powerful argument in favor of the existence of man's ancestors in Tertiary times. Fifteen years later Dr. Thomas Wilson chose for his subject, 'The Beginnings of Prehistoric Anthropology.'³ He not only had something to say about Tertiary man, but also covered the paleolithic and neolithic periods. In the more than seven years that have elapsed since Dr. Wilson's address was read, much progress has been made in the prehistoric archeology of Europe. This is especially true concerning our knowledge of the *colithic question* and of *paleolithic art* in so far as it has to do with engravings and frescoes on certain cavern walls. In fact, coliths and paleolithic mural decorations were not even mentioned by Dr. Wilson. He did refer, however, to Harrison's discoveries of 'paleoliths' on the Chalk Plateau of Kent, but confused these with the well-known river-drift implements.

THE EOLITHIC PERIOD

When Thomsen published his relative chronology for prehistoric times in 1836,

² Vice-presidential address, *Proc. A. A. A. S.*, 1884, XXXIII., 579.

³ Vice-presidential address, *Proc. A. A. A. S.*, 1899, XLVIII., 309.